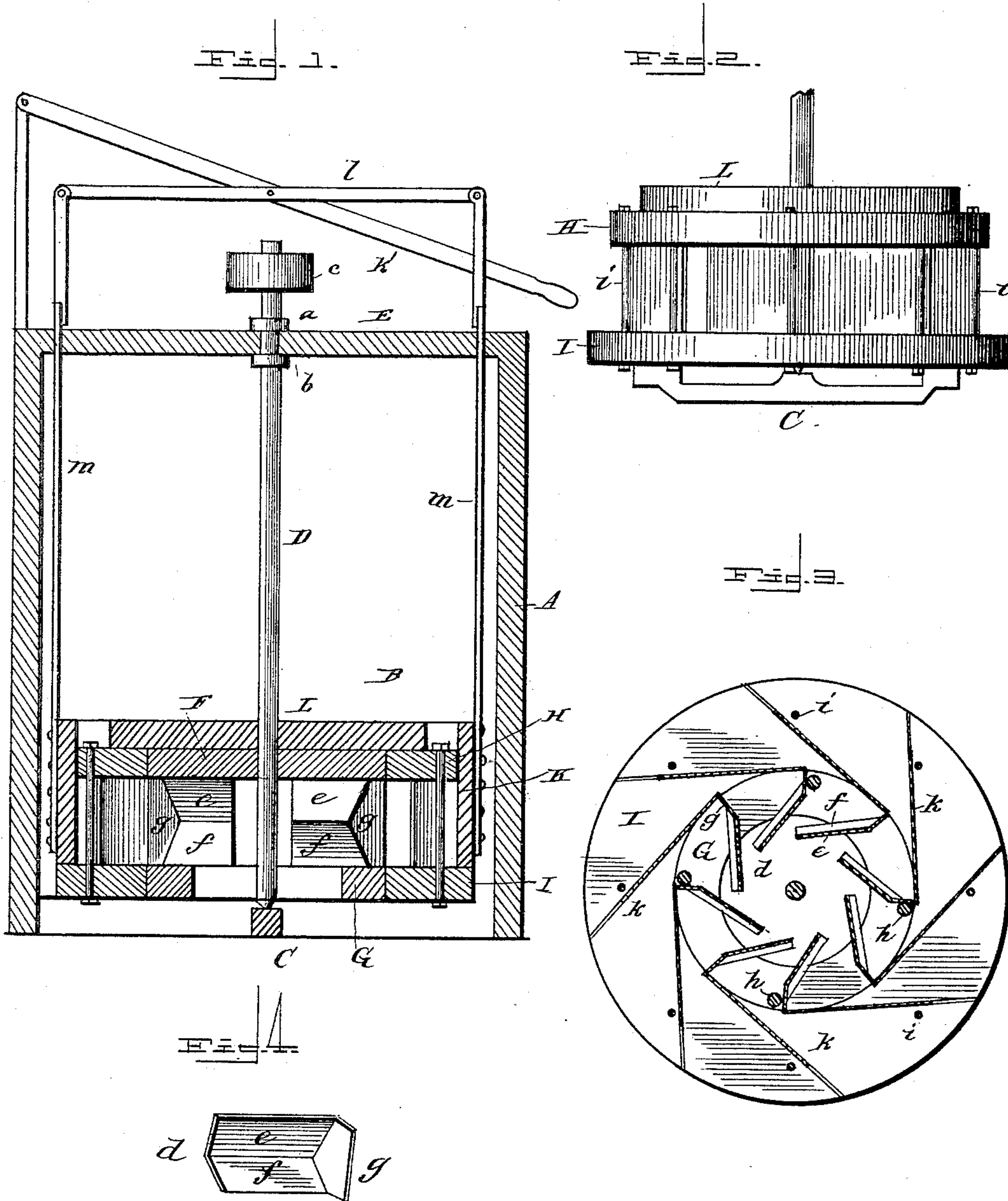


(No Model.)

C. W. HUDSON.
TURBINE WATER WHEEL.

No. 462,256.

Patented Nov. 3, 1891.



Witnesses

G. A. Taubenschmitt,
M. A. Reinohl.

Inventor

C. W. Hudson

By his Attorneys

Johnston, Reinohl & Dye

UNITED STATES PATENT OFFICE.

CHARLES W. HUDSON, OF CULPEPER, VIRGINIA, ASSIGNOR TO ANNIE L. HUDSON, OF SAME PLACE.

TURBINE WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 462,256, dated November 3, 1891.

Application filed September 6, 1890. Serial No. 364,189. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. HUDSON, a citizen of the United States, residing at Culpeper Court-House, in the county of Culpeper and State of Virginia, have invented certain new and useful Improvements in Turbine Water-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to water-wheels, and has especial reference to that class of wheels known as "turbine," and has for its object certain improvements in construction, which will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a vertical section of a penstock and my improved wheel; Fig. 2, a side elevation of the wheel; Fig. 3, a plan with the top ring removed, and Fig. 4 a perspective of one of the buckets.

Reference being had to the drawings and the letters thereon, A indicates the penstock, which is of ordinary construction, and within which is the wheel B, supported upon the step C by the shaft D resting thereon. The shaft is supported against lateral movement in a bar E, crossing the upper end of the penstock, and is provided with collars *a b*, one on each side of said bar. The shaft passes through the center of the bucket-wheel and is secured to the wheel F in any approved manner to cause the shaft to revolve with wheel, and the power is transmitted from the wheel by a pulley *c*, to which a belt (not shown) is attached. Between the plate F and the ring G are secured the buckets *d*, which are provided with parallel edges and converging sides *e f*, which meet in the horizontal center of the bucket, and a flange *g*, arranged at an angle to the horizontal plane of the bucket to receive the first impact of the water and direct it inward toward the center of the wheel, from which it is discharged through the ring G. The converging sides *e f* of the buckets direct the water toward the horizontal center of the buckets and hold the column of water in a compact body between the plate

F and ring G and until it leaves the buckets, thereby imparting to the wheel the greatest possible degree of its force. The plate F and ring G are secured together by bolts or rods *h*.

Surrounding the bucket-wheel is a case consisting of the top ring H and bottom ring I, secured together by rods *i*, and between the rings are chutes *k*, arranged at such an angle to the buckets *d* as to direct the inflowing water against the flange *g* of each bucket. The gate K surrounds the case and rests upon the bottom ring I, and is raised and lowered by a lever *k'*, connected to a bar *l*, attached to rods *m m*, which at their lower ends are secured to the gate, as shown in Fig. 1.

The supply of water to the wheel may be regulated by the degree of elevation given to the gate, so as to keep up the maximum power of the wheel, or it may be operated at any degree of power below the maximum desired.

Upon the top of the case is secured a plate L, which covers the bucket-wheel and through which the shaft D passes.

By the construction shown it will be observed that the water has three actions upon the wheel: first, from the chutes upon the flanges of the buckets; second, from the edges toward the horizontal center of the buckets where it is held until it has passed the plates, between which the buckets are secured, and is discharged near the center of the wheel; third, as the water leaves the inner end of the buckets, thereby utilizing the full power of the column of water.

Having thus fully described my invention, what I claim is—

1. In a turbine water-wheel having a central discharge, a bucket-wheel having straight buckets provided with parallel edges extending throughout the length of the buckets, and sides which converge from the edges toward the horizontal center of the buckets, and a vertical flange at the outer end of the buckets arranged at an angle to the horizontal plane of the buckets, in combination with a suitable casing.

2. In a turbine water-wheel having a central discharge, a bucket-wheel, an upper and lower support for the wheel, and straight buckets set at an acute angle to the axis of the

wheel and having parallel edges extending throughout the length of the buckets, and sides converging from the edges toward the horizontal center of the buckets, and a vertical flange at the outer end of the buckets arranged at an angle to the horizontal plane of the bucket.

3. In a turbine water-wheel having a side supply and central discharge, a bucket-wheel having straight horizontal buckets provided with continuous parallel edges, sides converging from the edges toward and meeting in the horizontal center of the buckets throughout

the length thereof, and a vertical flange at an angle to the horizontal plane of the buckets, in combination with a top and bottom ring, between which the bucket-wheel is suspended, and chutes constructed to direct the inflowing water upon the flanges of the buckets.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES W. HUDSON.

Witnesses:

CHARLES BARBOUR,

E. P. HUDSON.